

**B.TECH. DECVI/DELVI/DCSVI/ACECVI/  
ACELVI/ACCSVI**

**Term-End Examination**

June, 2013

00884

**OIEE-001 : BASICS OF ELECTRICAL  
ENGINEERING**

*Time : 2 hours*

*Maximum Marks : 70*

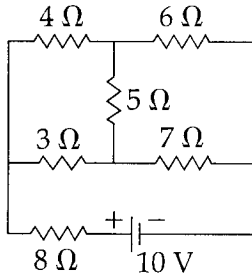
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- Note :** (i) *All the questions are to be answered in english language only.*  
(ii) *Attempt any five questions Q. 1 is compulsory.*
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1. Attempt the following objective type questions.

- (a) The unit of electrical energy is : 2x7=14  
(i) Watt-sec (ii) Joule  
(iii) kWh (iv) All of the above
- (b) An ideal voltage source should have :  
(i) zero internal resistance  
(ii) infinite internal resistance  
(iii) large value of emf  
(iv) low value of current
- (c) Hysteresis loss in a magnetic material depends upon :  
(i) Area of hysteresis loop  
(ii) Frequency of reversal of field  
(iii) Volume of the magnetic material  
(iv) All of the above

- (d) When the current flowing through a circuit is switched off then,
- (i) induced current flows in the same direction as that of the main current.
  - (ii) induced current flows in opposite as that of the main current.
  - (iii) no current will flow
  - (iv) None
- (e) Power factor of a pure inductive circuit is :
- (i)  $0^\circ$  leading
  - (ii)  $0^\circ$  lagging
  - (iii)  $90^\circ$  leading
  - (iv)  $90^\circ$  lagging
- (f) The power dissipated in the pure capacitance of an R-C circuit will be :
- (i) Zero
  - (ii) Small
  - (iii) High
  - (iv) Equal to dissipated in R
- (g) In case of 3-phase Y connected system relation between  $V_L$  and  $V_P$  is :
- (i)  $V_L = \sqrt{3} V_P$
  - (ii)  $V_P = \sqrt{3} V_L$
  - (iii)  $V_P = \frac{V_L}{3}$
  - (iv)  $V_L = \frac{V_P}{3}$

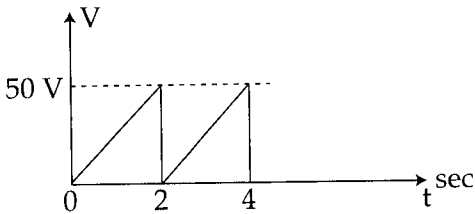
2. (a) State ohm's law. Discuss the effect of temperature on the resistance of a material.
- (b) Calculate the current in  $5\ \Omega$  resistance in the following network.  $7 \times 2 = 14$



3. (a) Prove that if three resistances of  $R$  ohm are connected in  $\Delta$  then their equivalent in the Y will be  $\frac{R}{3}$ .  $7 \times 2 = 14$
- (b) State the Venin's and Norton's theorem.
4. (a) Discuss the construction, working and applications of lead acid batteries.  $7 \times 2 = 14$
- (b) What are silver oxide cells ? Discuss in detail.
5. (a) Explain statically and dynamically induced emf.  $7 \times 2 = 14$
- (b) What is Reluctance ? Give the units of mmF, reluctance, flux and derive the relation between them.



6. (a) Find the r.m.s. and average value of following wave form. Also find Form Factor. 7x2=14



- (b) An impedance of  $(2 + j6) \Omega$  is connected in series with two impedances of  $(10 + j4) \Omega$  and  $(12 - j8) \Omega$  which are in parallel ? Calculate the supply current and power factor if the circuit is connected to 200 V.

7. (a) In 3-phase  $\Delta$  - connected system prove that 7x2=14  
 $I_L = \sqrt{3} I_P$  and  $P = \sqrt{3} V_L I_L \cos \phi$ .

- (b) 3 coils, each having an impedance of  $(20 + j15) \Omega$  are connected in  $\gamma$  to a 400 V, 3-phase, 50 Hz supply. Calculate

- (i) Line current
- (ii) Power factor
- (iii) Power supplied

8. Write short notes on *any four* : 3½x4=14

- (a) Series and parallel connection of batteries
  - (b) B - H Curve
  - (c) Principle of Self and Mutual Induction
  - (d) Behaviour of R - C series circuit on sinusoidal input
  - (e) Parallel Resonance
  - (f) Advantages of 3-phase system over 1-phase system
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